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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,171	04/10/2001	Hitoshi Ota	U 013390-0	8787

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26 West 61 Street
New York, NY 10023

EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

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DATE MAILED: 04/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/832,171

Applicant(s)

OTA ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-14 and 16-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-14 and 16-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. All outstanding rejections are overcome by applicants' amendment filed 12/23/02. The following rejection is non-final in light of the use of a new reference against the present claims, namely, Uemura et al. (U.S. 5,928,419).

Priority

2. As previously stated in paragraph 1 of the office action mailed 7/19/02, acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on 4/10/200 and 4/6/2001. It is noted, however, that applicant has not filed a certified copy of either Japanese application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of claim 16 is confusing because it depends on a cancelled claim, namely claim 15. Should the dependency of claim 16 be changed to claim 1?

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-3, 7-9, 11-12, 14, 16, 18-19, 21-23, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uemura et al. (U.S. 5,928,419) in view of Ichizawa et al. (U.S. 6,368,397) and Komatsu et al. (U.S. 6,524,383).

Uemura et al. disclose process for preparing pigment dispersion which comprises introducing at least one hydrophilic dispersability providing group such as sulfonate group onto the surface of the pigment to form self-dispersing pigment, dispersing 3% pigment in admixture with water and 10-15% wetting agent such as diethylene glycol, and adding 0.1-10% vinyl resin for providing dispersability wherein the resin has molecular weight of 25,000. The resin includes styrene-acrylic resin. The ink which contains the pigment dispersion has surface tension of 25-60 dyne/cm. The pigments include phthalocyanine pigment and quinacridone pigment and include pigments such as Solvent Yellow (col.1, lines 6-9, col.4, line 67-col.5, line 4, col.8, line 64-col.9, line 8, col.9, lines 54-59, col.16, lines 34-35, and Table 3). It is calculated that the resin possess glass transition temperature of, for instance, 77 °C (SE4, col.16, line 57).

The difference between Uemura et al. and the present claimed invention is the requirement in the claims of (a) amount of polyvalent ions present and (b) amount of hydrophilic dispersability providing group present on the pigment.

With respect to difference (a), Ichizawa et al., which is drawn to ink jet ink, disclose limiting the amount of impurities, i.e. polyvalent metal ions, present in the ink to less than 500 ppm so that nozzle clogging does not occur (col.7, lines 58-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control amount of polyvalent metal ions in Uemura et al. to less than 500 ppm in order to produce ink which will not clog printer nozzles, and thereby arrive at the claimed invention.

With respect to difference (b), while Uemura et al. disclose adding hydrophilic dispersability groups to pigment surface, there is no disclosure of the amount in which such groups are added.

On the one hand, given that the groups are used to control the dispersability and solubility of the pigment, it therefore would have been obvious to one of ordinary skill in the art to control the amount of hydrophilic dispersability groups present to amounts, including that presently claimed, in order to control the dispersability and solubility of the pigment, and thereby arrive at the claimed invention.

On the other hand, Komatsu et al., which is drawn to ink jet ink, disclose the use of pigment which comprises at least 10×10^{-6} equivalents dispersability imparting groups per gram pigment in order to produce stable ink and prevent agglomeration of pigment particles (col.13, lines 8-18).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use such amount of dispersability groups on the pigment of Uemura et al. in order to produce pigment which will not agglomerate and to form stable ink, and thereby arrive at the claimed invention.

7. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uemura et al. in view of Ichizawa et al. and Komatsu et al. as applied to claims 1-3, 7-9, 11-12, 16, 18-19, 21-23, and 26-27 above, and further in view of Fujimatsu et al. (U.S. 5,913,971).

The difference between Uemura et al. in view of Ichizawa et al. and Komatsu et al. and the present claimed invention is the requirement in the claims of specific type of printer used to print ink.

Uemura et al. generically disclose using ink jet printer.

Fujimatsu et al., which is drawn to ink jet ink, disclose that ink jet inks can be printed with drop-on-demand printers which are well known to energize the ink by dynamic or thermal energy in order to eject ink from printer and produce printed image (col.6, lines 55-61).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to print ink of Uemura et al. with drop-on-demand printer, and thereby arrive at the claimed invention.

8. Claims 1-3, 5-8, 10, 12-14, 17, 21-23, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. (U.S. 5,814,685) in view of Osumi et al. (U.S. 5,976,233) and Ichizawa et al. (U.S. 6,368,397).

Satake et al. disclose method of making pigment dispersion wherein the dispersion step comprises dispersing pigment which is mixed with wetting agent, i.e. surfactant, and water, followed by the addition of alkali-soluble resin that has acid number of 50-250 and molecular weight of 3,000-20,000. The resin is made from monomers which include acrylamide, styrene,

and acrylic acid. There is also disclosed an ink jet ink comprising the above dispersion wherein the ink has surface tension of 25-60 dyne/cm (i.e. mN/m) and is printed onto recording medium using ink jet printers to produce printed image (col.4, lines 37-39, 45, and 62-65, col.5, lines 1-4 and 50, col.6, lines 15-16, col.7, lines 66-67, col.8, lines 25-36 and 48-49, and col.9, line 58-col.10, line 6).

From example 1, for instance, it is seen that the dispersion comprises 20% pigment and ratio of nonionic surfactant to pigment of 1:4

The difference between Satake et al. and the present claimed invention is the requirement in the claims of (a) specific type of pigment, (b) acetylene glycol, and (c) amount of polyvalent ions present.

With respect to difference (a), Satake et al. disclose that the pigments include surface treated pigment having functionalized surface (col.6, lines 15-16).

Osumi et al., which is drawn to ink jet ink, disclose the use of pigment with hydrophilic group on its surface such as $-\text{COOM}$, $-\text{SO}_3\text{M}$, $-\text{PO}_3\text{HM}$, $-\text{SO}_2\text{NHCOR}$, $-\text{NH}_3$, and NR_3 where M is hydrogen, alkali metal, or ammonium. The motivation for using such pigment is that they have good dispersability in water and produce ink with good storage stability (col.3, lines 35-54, col.4, line 6, and col.4, line 61-col.5, line 4).

It is noted that there is no disclosure of the amount in which such hydrophilic groups are added to the pigment. However, given that the groups are used to control the dispersability and solubility of the pigment (col.4, line 61-col.5, line 4), it therefore would have been obvious to one of ordinary skill in the art to control the amount of hydrophilic dispersability groups present

to amounts, including that presently claimed, in order to control the dispersability and solubility of the pigment.

In light of the motivation for using specific type of pigment disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in Satake et al. in order to produce an ink good storage stability, and thereby arrive at the claimed invention.

With respect to difference (b), Satake et al. disclose the use of wetting agent such as nonionic surfactant including polyoxyalkylene glycol, but there is no disclosure of acetylene glycol as presently claimed.

Osumi et al. disclose the use of acetylene glycol surfactant identical to that presently claimed in order to improve ejection stability and fixing ability of the ink (col.6, lines 5-10 and 29-43). Further, Osumi et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Satake et al. (col.8, lines 10-11).

In light of the motivation for using acetylene glycol disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use acetylene glycol in Satake et al. in order to produce ink with improved ejection stability and fixing ability of the ink, and thereby arrive at the claimed invention.

With respect to difference (c), Ichizawa et al., which is drawn to ink jet ink, disclose limiting the amount of impurities, i.e. polyvalent metal ions, present in the ink to less than 500 ppm so that nozzle clogging does not occur (col.7, lines 58-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control amount of polyvalent metal ions in Satake et al. to less than 500 ppm in order to produce ink that will not clog printer nozzles, and thereby arrive at the claimed invention.

9. Claims 1-3, 7-8, 10, 12-14, 17-23, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. (U.S. 5,814,685) in view of Johnson et al. (U.S. 6,336,965), Osumi et al. (U.S. 5,976,233), and Ichizawa et al. (U.S. 6,368,397).

Satake et al. disclose method of making pigment dispersion wherein the dispersion step comprises dispersing pigment which is mixed with wetting agent, i.e. surfactant, and water, followed by the addition of alkali-soluble resin that has acid number of 50-250 and molecular weight of 3,000-20,000. The resin is made from monomers which include acrylamide, styrene, and acrylic acid. There is also disclosed an ink jet ink comprising the above dispersion wherein the ink has surface tension of 25-60 dyne/cm (i.e. mN/m) and is printed onto recording medium using ink jet printers to produce printed image (col.4, lines 62-65, col.5, lines 1-4, col.6, lines 15-16, col.7, lines 66-67, col.8, lines 25-36 and 48-49, and col.9, line 58-col.10, line 6).

From example 1, for instance, it is seen that the dispersion comprises 20% pigment and ratio of nonionic surfactant to pigment of 1:4

The difference between Satake et al. and the present claimed invention is the requirement in the claims of (a) specific type of pigment, (b) acetylene glycol, and (c) amount of polyvalent ions present.

With respect to difference (a), Satake et al. disclose that the pigments include surface treated pigment having functionalized surface (col.6, lines 15-16).

Johnson et al. disclose the use of pigment surface treated to attach polymer comprising functional groups such as -OR, -COOR, -SO₃H, and -PO₃H to the surface wherein the pigments include carbon black and colored pigments such as Pigment Red, Pigment, Blue, and Pigment Yellow selected from class of pigments such as quinacridones, phthalocyanine, and anthraquinone (col.4, lines 9-24, col.4, line 66-col.5, line 27, and col. 6, lines 23-56). The motivation for using such pigment is that the pigment has improved dispersability and dispersion stability (col.1, lines 52-55).

It is noted that there is no disclosure of the amount in which the functional groups are added to the pigment. However, given that the groups are used to control the dispersability and solubility of the pigment (col.4, line 61-col.5, line 4), it therefore would have been obvious to one of ordinary skill in the art to control the amount of hydrophilic dispersability groups present to amounts, including that presently claimed, in order to control the dispersability and solubility of the pigment.

In light of the motivation for using specific type of pigment disclosed by Johnson et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in Satake et al., and thereby arrive at the claimed invention.

With respect to difference (b), Satake et al. disclose the use of wetting agent such as nonionic surfactant including polyoxyalkylene glycol, but there is no disclosure of acetylene glycol as presently claimed.

Osumi et al. disclose the use of acetylene glycol surfactant identical to that presently claimed in order to improve ejection stability and fixing ability of the ink (col.6, lines 5-10 and

29-43). Further, Osumi et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Satake et al. (col.8, lines 10-11).

In light of the motivation for using acetylene glycol disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use acetylene glycol in Satake et al. in order to produce ink with improved ejection stability and fixing ability of the ink, and thereby arrive at the claimed invention.

With respect to difference (c), Ichizawa et al., which is drawn to ink jet ink, disclose limiting the amount of impurities, i.e. polyvalent metal ions, present in the ink to less than 500 ppm so that nozzle clogging does not occur (col.7, lines 58-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control amount of polyvalent metal ions in Satake et al. to less than 500 ppm in order to produce ink that will not clog printer nozzles, and thereby arrive at the claimed invention.

Response to Argument

10. Applicants arguments regarding Parazak et al. (U.S. 6,821,267) have been fully considered but they are moot in view of the discontinuation of the use of this reference against the present claims.

11. Applicants' arguments filed 12/23/02 have been considered, but with the exception of arguments relating to Parazak et al., they are not persuasive.

Specifically, applicants argue that there is no motivation to combine Satake et al. with Osumi et al. given that Osumi et al. adds acetylene glycol surfactant to ink after the pigment dispersion has already been prepared.

However, it is noted that Osumi et al. is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely the equivalence and interchangeability of surfactants used in ink jet inks, and in combination with the primary reference, discloses the presently claimed invention. If the secondary reference contained all the features of the present claimed invention, it would be identical to the present claimed invention, and there would be no need for secondary references.

While Osumi et al. do disclose adding surfactant to ink after forming pigment dispersion, it is noted that Osumi et al. is not used to teach adding surfactant or wetting agent to pigment to form pigment dispersion. Satake et al. already disclose adding wetting agent to pigment in order to form pigment dispersion. However, Satake et al. do not disclose specific type of surfactant or wetting agent. This is why Satake et al. is used in combination with Osumi et al.; to teach specific types of surfactant or wetting agent.

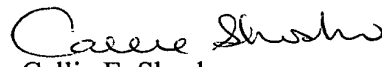
In light of the above, it is the examiner's position that the combination of Satake et al. with Osumi et al. is proper.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Examiner
Art Unit 1714

CS
March 24, 2003